

What is claimed is:

1. A method of modulating a source data to be written onto an optical recording medium under the conditions of a given code rate and limited run length, comprising the steps of:

5 (a) modulating the source data based on a first mapping table and modulating the same source data based on a second mapping table, the first mapping table containing coded data corresponding to the source data, the second mapping table containing at least one coded data, capable of suppressing low
10 frequency components, which at least one source data among all source data contained in the first mapping table is mapped to; and

(b) selecting one of the modulated data based on at least one among the conditions of the value of a previous source data,
15 the time when low-frequency suppression has been conducted, the value of subsequent modulated data, and whether or not RLL constraints are violated.

2. The method set forth in claim 1, wherein said step (b) comprises the steps of:

20 calculating each digital sum value of the modulated data; choosing one of the two data modulated according to the first and the second mapping table in response to a control signal for suppressing low-frequency components;

converting the chosen modulated data to channel data
25 matching the optical recording medium; and

recording the channel data onto the optical recording medium.

3. The method set forth in claim 2, wherein the channel data has the run length ranging from 1 to 8.

4. The method set forth in claim 1, wherein the first mapping table is composed of a 2/3 sub-table containing 3-bit coded data for 2-bit source data, a 4/6 sub-table containing 6-bit coded data for 4-bit source data, a 6/9 sub-table containing 9-bit coded data for 6-bit source data, a 8/12 sub-table containing 12-bit coded data for 8-bit source data, and a 10/15 sub-table containing 15-bit coded data for 10-bit source data.

5. The method set forth in claim 4, wherein the second mapping table is composed of a 2/3 low-frequency suppressing sub-table in which at least one 3-bit low-frequency suppressing coded data is contained for at least one source data among all the source data contained in the 2/3 sub-table, and a 4/6 low-frequency suppressing sub-table in which at least one 6-bit low-frequency suppressing coded data is contained for at least one source data among all the source data contained in the 4/6 sub-table.

6. The method set forth in claim 4, further comprising the step of modulating a current source data using the first mapping table if a source data is modulated right before using one of the 6/9 sub-table and the 8/12 sub-table.

7. A method of demodulating a channel data written onto an optical recording medium, comprising the steps of:

(a) reading a channel data from the optical recording medium, the channel data having been modulated from a source data using a table selected among a plurality of mapping tables

based on at least one among the conditions of the value of a previous source data, the time when low-frequency suppression has been conducted, the value of subsequent modulated data, and whether or not RLL constraints are violated; and

5 (b) demodulating the read channel data using a plurality of de-mapping tables in which a decoded data corresponding to the channel data is contained.

8. An apparatus of modulating a source data to be written onto an optical recording medium under the conditions of a given code rate and limited run length, comprising:

10 a modulator modulating the source data based on a first mapping table and modulating the same source data based on a second mapping table, the first mapping table containing coded data corresponding to the source data, the second mapping table containing at least one coded data, capable of suppressing low frequency components, which at least one source data among all source data contained in the first mapping table is mapped to; and

15 a controller selecting one of the modulated data based on at least one among the conditions of the value of the source data, the time when low-frequency suppression has been conducted, the value of subsequent modulated data, and whether or not RLL constraints are violated.

20 9. The apparatus set forth in claim 8, further comprising a pattern detecting/low-frequency suppressing control signal generating unit generating a pattern match signal indicating a mapping table for a given source data to control said modulator,

and generating a low-frequency suppressing control signal to control said controller, the low-frequency suppressing control signal being indicative of the time when a low-frequency suppressing control is conducted.

5 10. The apparatus set forth in claim 9, wherein said controller comprises:

 a calculator each digital sum value of the modulated data;

 a selector choosing one of the two data modulated according to the first and the second mapping table in response to a
10 control signal for suppressing low-frequency components;

 a converter converting the chosen modulated data to channel data matching the optical recording medium; and

 a writing unit recording the channel data onto the optical recording medium.

15 11. The apparatus set forth in claim 10, wherein the channel data has the run length ranging from 1 to 8.

 12. The apparatus set forth in claim 8, wherein the first mapping table is composed of a 2/3 sub-table containing 3-bit coded data for 2-bit source data, a 4/6 sub-table containing 6-
20 bit coded data for 4-bit source data, a 6/9 sub-table containing 9-bit coded data for 6-bit source data, a 8/12 sub-table containing 12-bit coded data for 8-bit source data, and a 10/15 sub-table containing 15-bit coded data for 10-bit source data.

 13. The apparatus set forth in claim 12, wherein the second
25 mapping table is composed of a 2/^A/3 low-frequency suppressing sub-table in which at least one 3-bit low-frequency suppressing coded data is contained for at least one source data among all

the source data contained in the 2/3 sub-table, and a 4/6 low-frequency suppressing sub-table in which at least one 6-bit low-frequency suppressing coded data is contained for at least one source data among all the source data contained in the 4/6 sub-table.

14. An apparatus of demodulating a channel data written onto an optical recording medium, comprising:

a detector reading a channel data from the optical recording medium, the channel data having been modulated from a source data using a table selected among a plurality of mapping tables based on at least one among the conditions of the value of a previous source data, the time when low-frequency suppression has been conducted, the value of subsequent modulated data, and whether or not RLL constraints are violated;

and
a demodulator demodulating the read channel data using a plurality of de-mapping tables in which a decoded data corresponding to the channel data is contained.